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EXAMINER

ODOM, CURTIS B

ART UNIT

PAPER NUMBER

2634

DATE MAILED: 06/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/473,361

Applicant(s)

KIM ET AL.

Examiner

Curtis B. Odom

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 7-10 is/are rejected.
- 7) ☒ Claim(s) 4-6 and 11-13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jafarkhani et al. (U.S. Patent No. 6, 125, 149).

Regarding claim 1, Jafarkhani et al. discloses a quantization method for an iterative decoder (column 6, line 34-38), comprising the steps of:

equally dividing (column 7, lines 21-34) received signal levels into predetermined intervals; and

quantizing the level of a signal received in each period, using the predetermined intervals (column 5, lines 36-38).

Jafarkhani et al. does not disclose the intervals occupy a range $m \times 2^1$ where the transmission signal level from the transmitter is m .

However, Jafarkhani et al. discloses dividing the signal span and choosing levels (intervals) which span the entire signal range (column 7, lines 21-34). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made that the intervals could have been chosen to occupy a range of $m \times 2^1$ in order to properly cover the entire

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signal span and reduce the probability of error during quantization by having a received signal level fall outside of the predetermined intervals.

Regarding claim 2, which inherits the limitations of claim 1, Jafarkhani et al. does not disclose l is 2. However, Jafarkhani et al. discloses dividing the signal span and choosing levels (intervals) which span the entire signal range (column 7, lines 21-34). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made that the intervals could have been chosen to occupy a range of $m \times 2^2$ in order to properly cover the entire signal span and reduce the probability of error during quantization by having a received signal level fall outside of the predetermined intervals.

Regarding claim 3, which inherits the limitations of claim 1, Jafarkhani et al. does not disclose l is 1. However, Jafarkhani et al. discloses dividing the signal span and choosing levels (intervals) which span the entire signal range (column 7, lines 21-34). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made that the intervals could have been chosen to occupy a range of $m \times 2$ in order to properly cover the entire signal span and reduce the probability of error during quantization by having a received signal level fall outside of the predetermined intervals.

Regarding claim 7, Jafarkhani et al. discloses a quantization method for a turbo decoder (column 6, lines 34-38) in a communication system, wherein an iterative decoder can be a turbo decoder, comprising the steps of:

equally dividing (column 7, lines 21-34) received signal levels into 8 or 16 quantization scaling factor intervals using 5 to 7 quantization bits (column 3, lines 50-60);

quantizing the level of a signal received in each period, using the (column 5, lines 36-38).

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Jafarkhani et al. does not disclose the intervals are within a range $m \times 2^l$ where the transmission signal level from the transmitter is m .

However, Jafarkhani et al. discloses dividing the signal span and choosing levels (intervals) which span the entire signal range (column 7, lines 21-34). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made that the intervals could have been chosen within a range of $m \times 2^l$ in order to properly cover the entire signal span and reduce the probability of error during quantization by having a received signal level fall outside of the predetermined intervals.

Regarding claim 8, which inherits the limitations of claim 7, Jafarkhani et al. does not disclose l is 2. However, Jafarkhani et al. discloses dividing the signal span and choosing levels (intervals) which span the entire signal range (column 7, lines 21-34). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made that the intervals could have been chosen to occupy a range of $m \times 2^2$ in order to properly cover the entire signal span and reduce the probability of error during quantization by having a received signal level fall outside of the predetermined intervals.

Regarding claim 9, which inherits the limitations of claim 7, Jafarkhani et al. further discloses the number of quantization bits is 6 (column 3, line 60), wherein the signal frame sequence is converted to a sequence of bits and the sequence of bits is 6.

Regarding claim 10, which inherits the limitations of claim 9, Jafarkhani et al. further discloses the quantization scaling factor interval is 8, wherein there is a quantization scaling factor used to convert the received signal into a sequence of bits based on quantized levels (column 3, lines 24-29), and the scaling factor is 8 depending of the received signal.

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Allowable Subject Matter

3. Claims 4-6 and 11-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Van De Kerkhof et al. (U.S. Patent No. 5, 661, 755) discloses a quantization method for a decoder wherein dividing a signal into a plurality of signal blocks and quantizing the signal blocks.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 703-305-4097. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

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Curtis Odom
May 27, 2003



STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
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